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Trait emotional intelligence anchored within the Big Five, Big Two and Big One frameworks

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ABSTRACT

This paper investigates the relationship between trait emotional intelligence (trait EI) and the Big Five factors, the Big Two and the Big One (i.e., *General Factor of Personality*; GFP). Comprehensive measures of trait EI (TEIQue) and the Big Five (NEO-PI-R) were applied to a sample of 289 university students (170 female). As expected by the trait EI theory, part of the construct's variance was explained by a linear combination of the Big Five, while a distinct oblique trait EI factor was isolated in the Big Five factor space, in line with previous research. Trait EI positively correlated with the Big Two, namely Alpha/Stability and Beta/Plasticity. Finally, correlations between trait EI and the GFP were higher than those between GFP and the Big Five factors from which it was extracted. In addition, when GFP was extracted from the joint data set combining the Big Five factors of the NEO-PI-R and the dimensions (factors or facets) of the TEIQue, the highest loadings came from the latter, not from the former. Findings support the view that trait EI is a broad personality trait integrated into multi-level personality hierarchies and the idea that trait EI can be considered as a proxy of the GFP.

1. Introduction

Even though there is consensus regarding the correlations observed among the Big Five (B5), the key question is what these correlations represent and what is the psychological meaning of the meta-traits found (Ferguson, Chamorro-Premuzic, Pickering, & Weiss, 2011).

Digman (1997) extracted two super-factors from the B5, namely *Alpha* (encompassing agreeableness -A-, conscientiousness -C-, and neuroticism -N-), and *Beta* (encompassing extraversion -E- and openness -O-), which represent desirable and advantageous personality traits and are linked to the processes of socialization and personal growth. These Big Two (B2) have been replicated by DeYoung, Peterson, and Higgins (2002) who re-labeled the super-factors as Alpha as *Stability* and Beta as *Plasticity*, and observed they were correlated (r = .24).

In addition, a wealth of research has provided strong evidence for a General Factor of Personality (GFP; see Rushton and Irwing (2011), for an overview), which is thought to have evolved as a result of natural selection of social effectiveness and has a heritable component (e.g., Rushton, Bons, & Hur, 2008). Nonetheless, some researchers argue that the GFP might be a mere statistical artifact (e.g., Ferguson et al., 2011).

In sum, the literature supports the existence of a hierarchical structure of personality in which the B5 are subsumed under two more general factors, which in turn are subsumed under another super-factor, the GFP, also called the Big One (Musek, 2007), *p*-factor (Hofstee, 2001), or the Primordial One (Hofstee, 2003). This factor is the apex of the hierarchy of personality (e.g., Rushton & Irwing, 2011), the same way that "*g*" is located at the highest level in the hierarchy of cognitive abilities (Carroll, 1993).

Emotional intelligence (EI) was originally presented as a "subset of social intelligence" aiming to "enhance living" (Salovey & Mayer, 1990), thus highlighting its adaptive nature, in particular regarding social interaction, similarly to the GFP (McIntyre, 2010).

1.1. Trait emotional intelligence

Trait EI has been defined as a constellation of emotional self-perceptions and behavioral dispositions located at the lower levels of personality hierarchies (Petrides, 2011; Petrides, Pita, & Kokkinaki, 2007). It provides a comprehensive operationalization of the affect-related aspects of personality in greater detail than general B5 models (Vernon, Villani, Schermer, & Petrides, 2008),

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and it lies wholly outside the taxonomy of human cognitive abilities (Carroll, 1993).

1.2. The location of trait EI in the personality factor space

Trait EI has been found to share approximately 50% of the variance with the B5 (Petrides, Furnham, & Mavroveli, 2007; Petrides et al., 2010). In addition, recent research revealed that correlations between trait EI and the B5 are strong, replicable and genetically influenced (Vernon et al., 2008).

There is some robust, yet scant, empirical evidence that trait EI can be psychometrically isolated in the personality factor space defined by the Giant Three and the B5 as well. Exploratory factor analyses (EFA) showed that trait EI facets tend to cluster together into a distinct oblique factor, rather than being dispersed among the factors emerging from the Giant Three and B5 (Petrides, 2001; Petrides, Pita, et al., 2007). This finding indicates that trait EI captures some unique variance of personality.

1.3. Trait EI and the B2

To our knowledge, no research has been conducted exploring the relationship between trait EI and the B2. Extending previous conceptual analysis of their association by McRae (2000), De Raad (2005) found that the overlap between trait EI and the B5 is mainly driven by A and emotional stability (negative pole of N). Additionally, Joseph and Newman (2010) found strong latent correlations between trait EI and A, C, and N, which are the three components of Alpha/Stability as stated earlier. Alpha/Stability might contribute mainly to social and emotional adjustment, while Beta/Plasticity might be a facilitator of social learning; therefore it is reasonable to expect that trait EI would be more strongly associated to the former than the latter.

1.4. Trait EI and the GFP

Van der Zee, Thijs, and Schakel (2002) suggested that the GFP (i.e., *p*-factor proposed by Hofstee, 2001) is conceptually rather close to emotional intelligence. Recent studies have supported that idea by showing considerable overlap between GFP and trait EI through two kinds of evidence: (a) A GFP can be extracted from joint data sets combining comprehensive measures of trait EI and personality, where the highest loadings in that GFP come from the trait EI facets or factors (McIntyre, 2010; Rushton et al., 2009; Veselka, Schermer, Petrides, & Vernon, 2009; Veselka, Schermer, Petrides, Cherkas, et al., 2009); (b) The mean correlation between trait EI and the GFP seems to be around $r = .72$, which remains substantive even after social desirability bias is controlled (Van der Linden, Tsaousis, & Petrides, 2012).

The present study aims to investigate: (a1) the convergent validity of trait EI with regards to the B5, examining their correlations as well as what percentage of variance in trait EI is explained by a linear combination of the B5; (a2) the discriminant validity of trait EI with regard to the B5, exploring their location in the B5 factor space; (b) the relationship between trait EI and the B2 and (c) the overlap between trait EI and GFP.

2. Method

2.1. Participants

The sample consisted of 289 Spanish university students (170 female) ranging in age from 18 to 36 years old ($M = 20.84$, $SD = 2.41$).

2.2. Measures

2.2.1. B5

The B5 factors were measured using the *NEO Personality Inventory-Revised* (NEO PI-R; Costa & McCrae, 1992). The internal consistencies are reported in parentheses in Table 3.

2.2.2. Trait emotional intelligence

Trait emotional intelligence was measured through the *Trait Emotional Intelligence Questionnaire* (TEIQue v. 1.0; Petrides, 2001). It consists of 144 items, rated on a 7-point Likert scale, and it covers 15 distinct facets grouped in four factors, namely well-being (W), emotionality (E), sociability (S), and self-control (C). The internal consistencies of the TEIQue scales are reported in parentheses in Table 3, while those of the WESC factors were .84, .73, .70, and .75, respectively.

2.3. Procedure

Students signed a consent form indicating their voluntary participation in the study. Data were collected during class time and testing sessions lasted one and a half hours with a 10-min break between the questionnaires.

2.4. Statistical analyses

Our extraction and rotation criteria were similar as those used in previous studies (i.e., McIntyre, 2010; Petrides, 2001; Petrides, Pita, et al., 2007; Veselka, Schermer, Petrides, & Vernon, 2009; Veselka, Schermer, Petrides, Cherkas, et al., 2009).

3. Results

3.1. The location of trait EI in the B5 factor space

Moderate to high correlations were found between trait EI and the B5 (see Table 1); the highest correlation with N ($r = -.63$) and the lowest with A ($r = .16$). The mean inter-correlation between the global trait EI and the B5 was $r = .38$.

A multiple regression analysis was carried out with trait EI as the criterion variable and the B5 as predictors. These results are depicted in Table 2. All the B5 were significant predictors of trait EI except A, and they jointly predicted 57.3% of the trait EI variance.

We ran an EFA of the 30 NEO-PI-R facets and the 15 TEIQue facets following a principal axis factor extraction and using Oblimin (delta = 0) and Promax (kappa = 4) rotations. The six-factor solution (see Tables 3 and 4) was very similar using the two rotation methods. Trait EI emerged as a distinct oblique factor under the B5 factor space. The mean inter-correlation between the trait EI factor and the B5 factors was $r = .25$.

Among the 15 trait EI facets, six showed moderate-to-high loadings on the trait EI factor (>.30), namely Emotion perception (.76), Emotion expression (.71), Social awareness (.57), Interpersonal regulation (.52), Empathy (.56), and Relationships (.46).

3.2. Trait EI and the B2

We first investigated the existence of a higher-order factor in the B5 latent space. The five NEO-PI-R scales were subjected to principal component analysis (PCA) using Oblimin (delta = 0) rotation (see Table 5). Two components were clearly evident (eigenvalues >1), equivalent to the Alpha/Stability (C, A, and N loadings) and Beta/Plasticity super-factors (O and E loadings). These two super-factors (B2) explained 55.14% of the variance, with Beta/Plasticity explaining a higher percentage than Alpha/Stability, and they were positively correlated ($r = .16$, $p < .01$).